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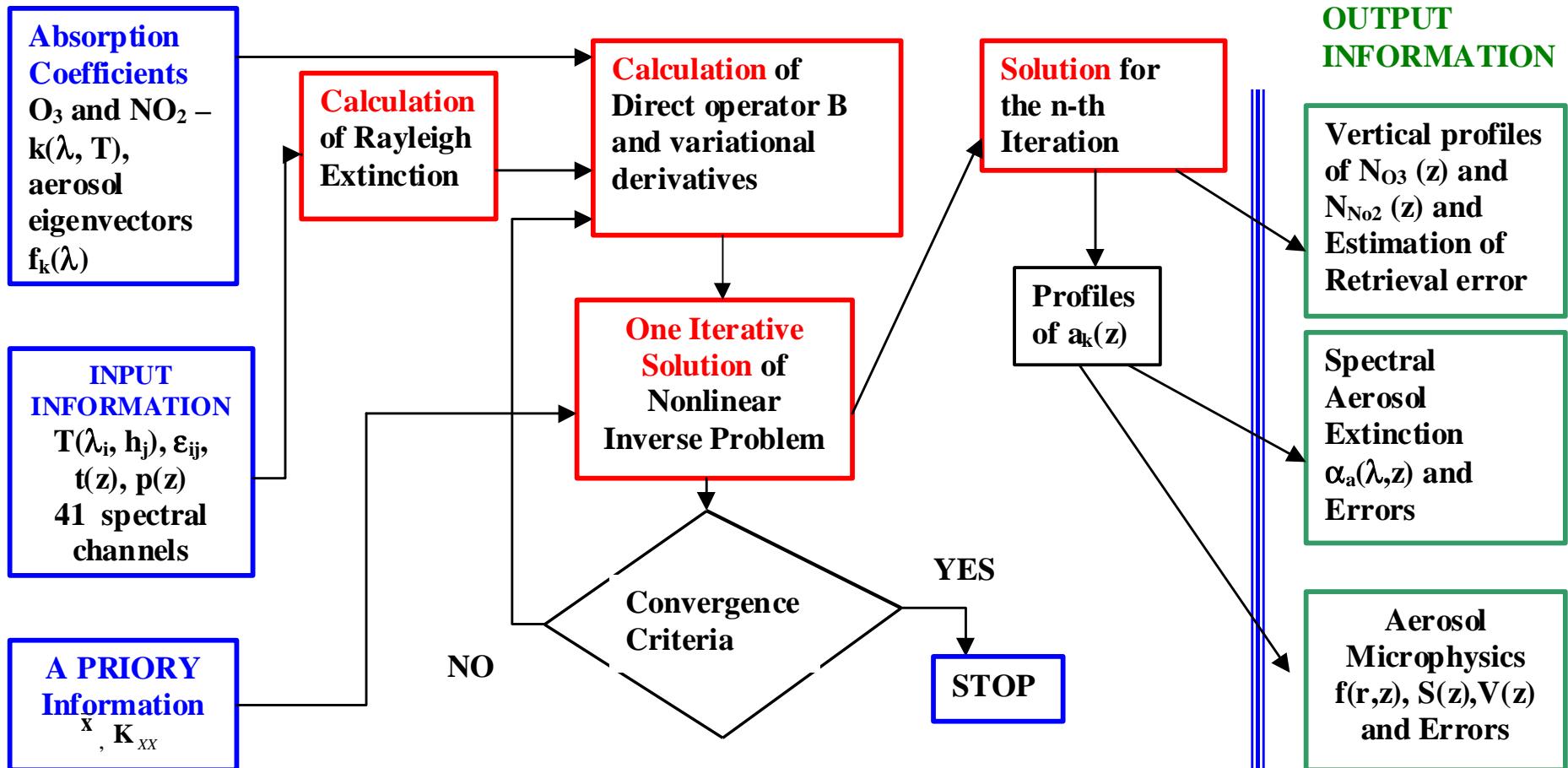
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O₃, NO₂, and Aerosol Sounding of the Atmosphere in Sun Occultation Experiment with SAGE III Device

Solar Occultation Satellite Science Team Meeting

May 6-7, 2003

Block-scheme of Interpretation Algorithm



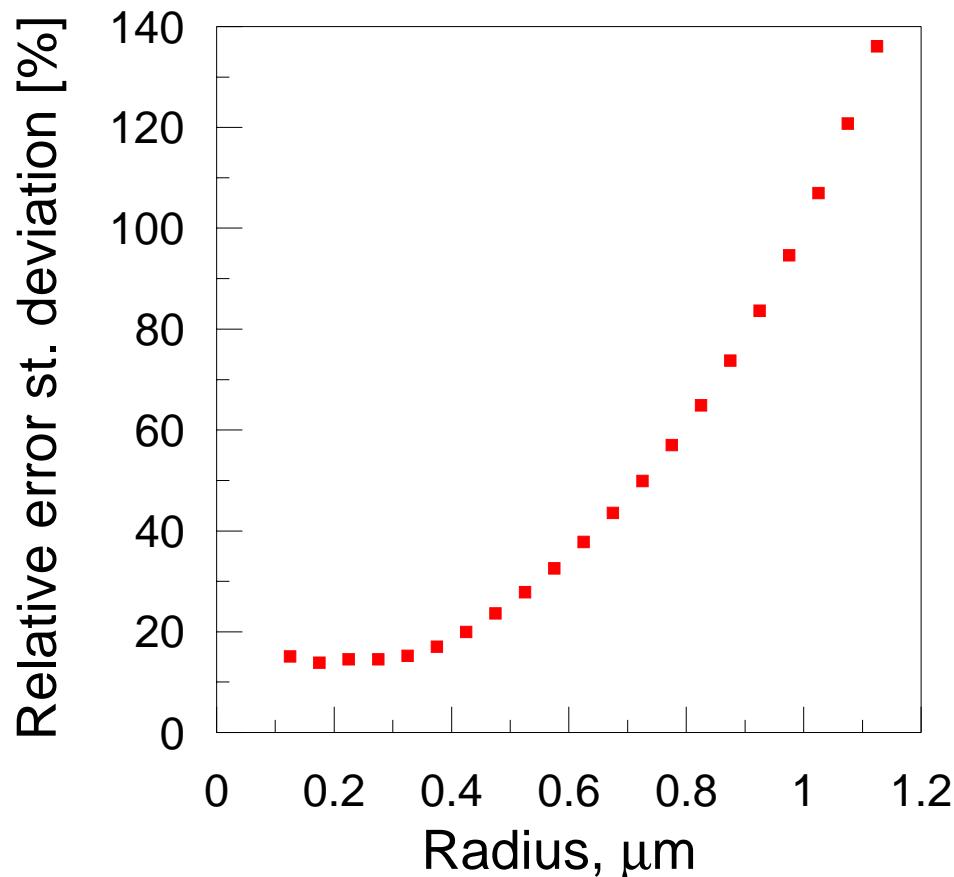
Errors of Retrieving the Atmospheric Parameters

Numerical Experiment

Atmospheric model and measurement conditions	Retrieval RMS error				Relative residual
	NO ₂ (20-45km), relative, %	Ozone (12-40km), relative, %	Ozone (40-70km), relative, %	Aerosol extinction coefficient, km ⁻¹	
Basic model	6.0	5.4	4.9	0.64E-4	0.96
(NO ₂)x2	3.4	5.4	4.9	0.65E-4	0.96
Haze aerosol	8.6	12	5.4	0.14E-3	0.98
Background aerosol, 4 vectors	8.3	5.6	5.0	0.69E-4	0.97
Background aerosol, 3 vectors	7.8	5.6	6.1	0.66E-4	1.07
Background Aerosol, 2 vectors	60	9.1	15	0.13E-3	9.0
(Measurement Error)x2	6.8	7.4	5.9	0.84E-4	0.97
(Measurement Error)/2	0.44E-4	3.9	4.0	5.0	0.96
Tangent height error (0.5 km)	0.18E-3	9.6	12.4	16.8	1.01

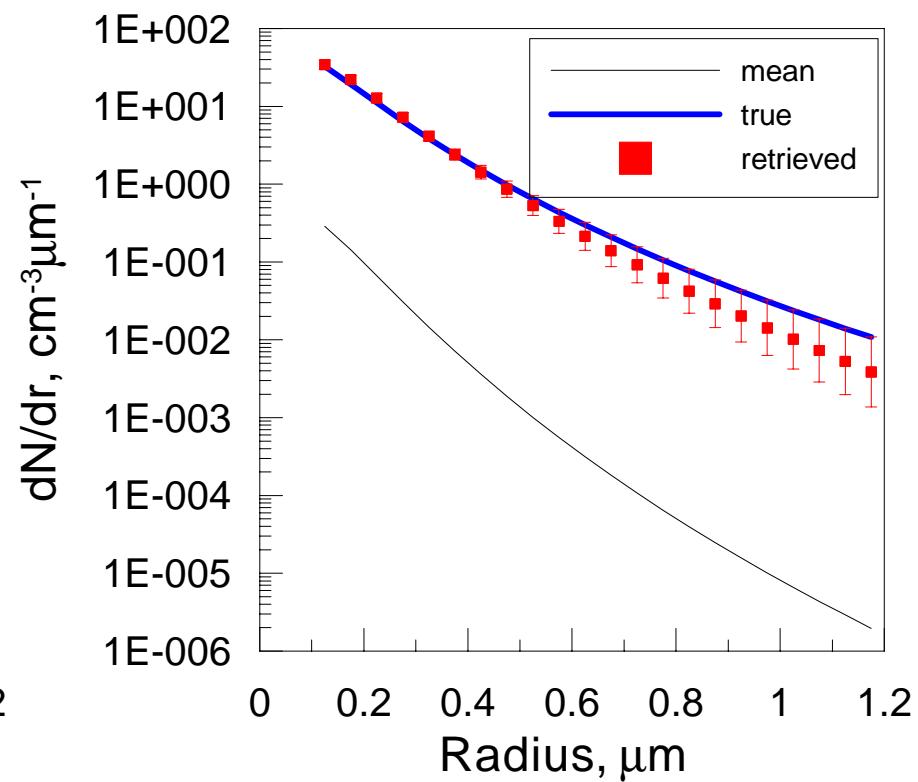
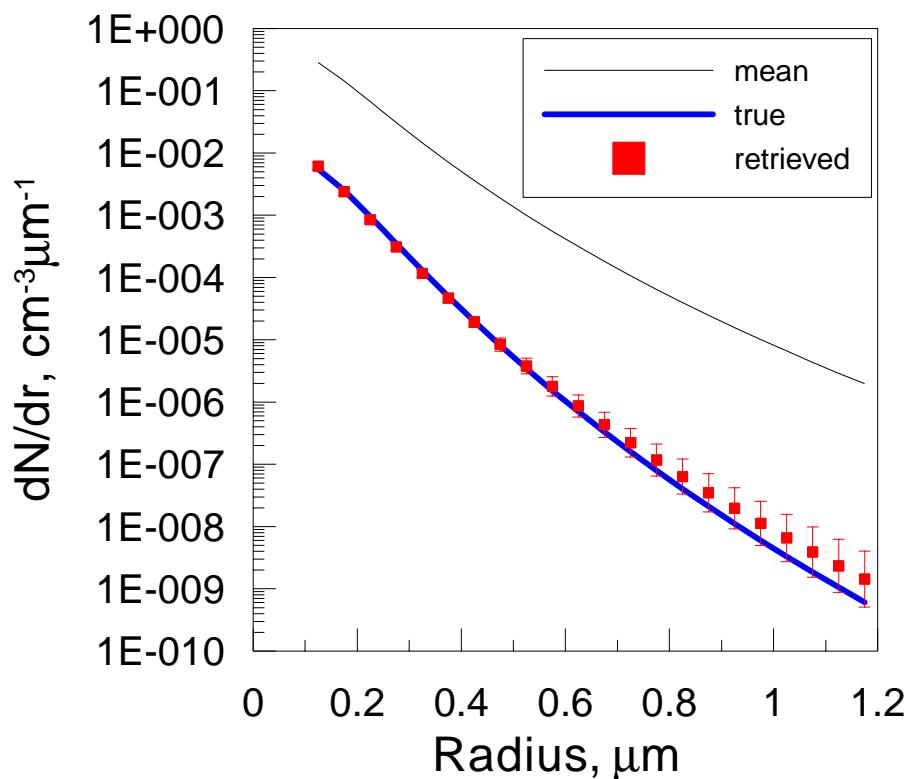
Error of Retrieving the Aerosol Size Distribution Function

Numerical experiments. 22 bins for radius, total number of cases: 300.

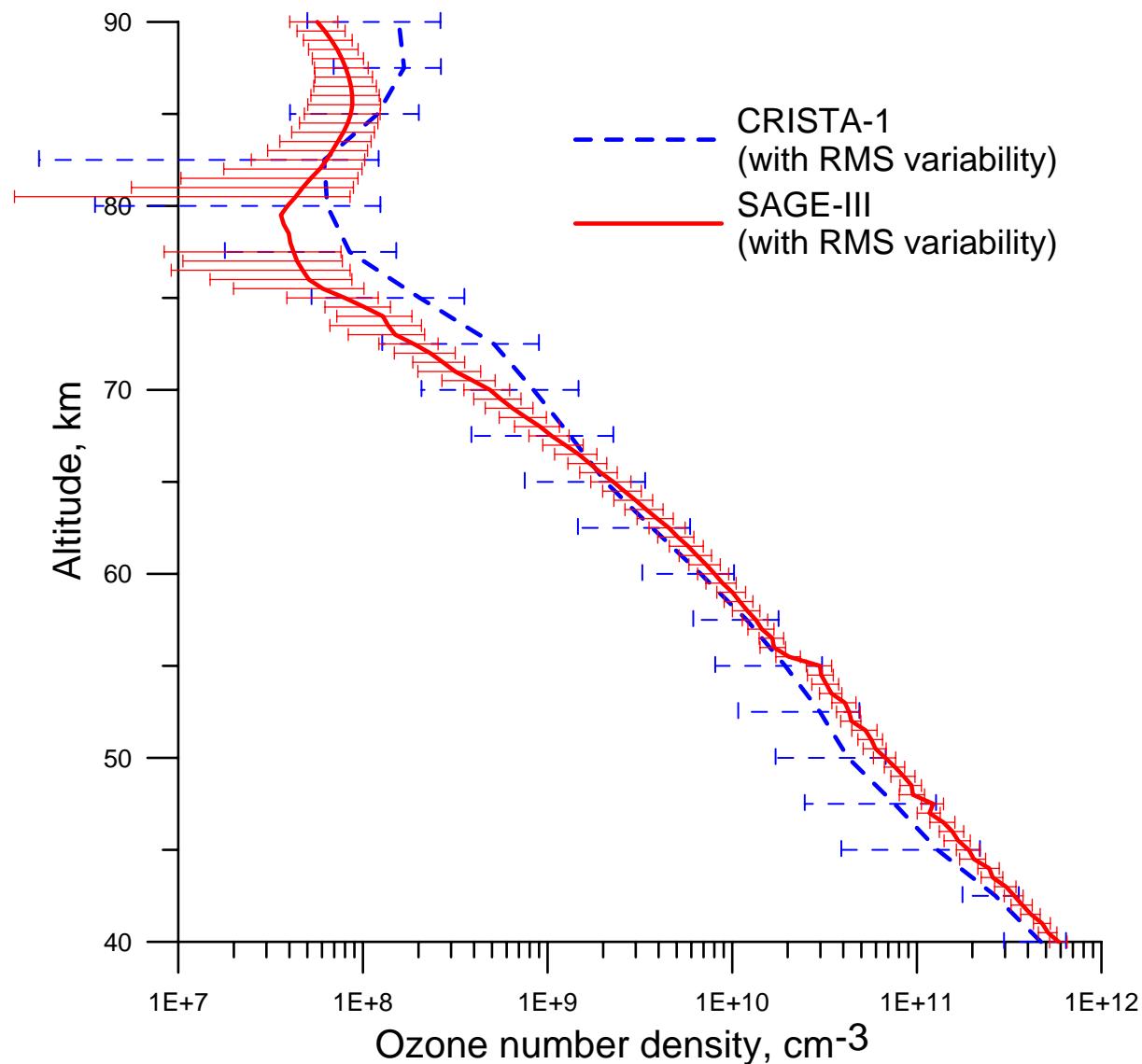


Retrieval of Aerosol Size Distribution Function

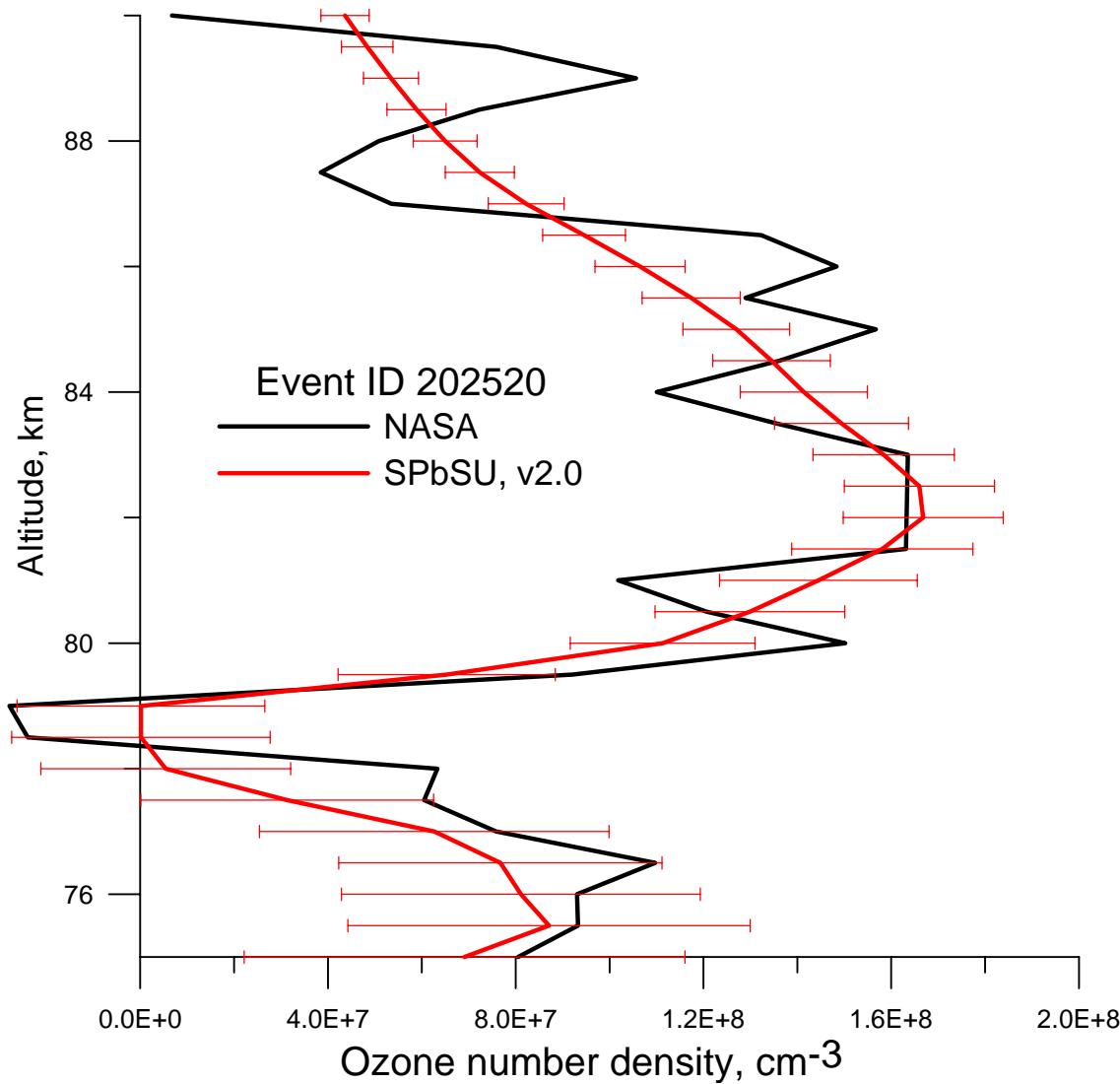
Numerical experiments. Size distribution function is presented using 22 radius bins



CRISTA-1 and SAGE-III Mean Ozone Profiles



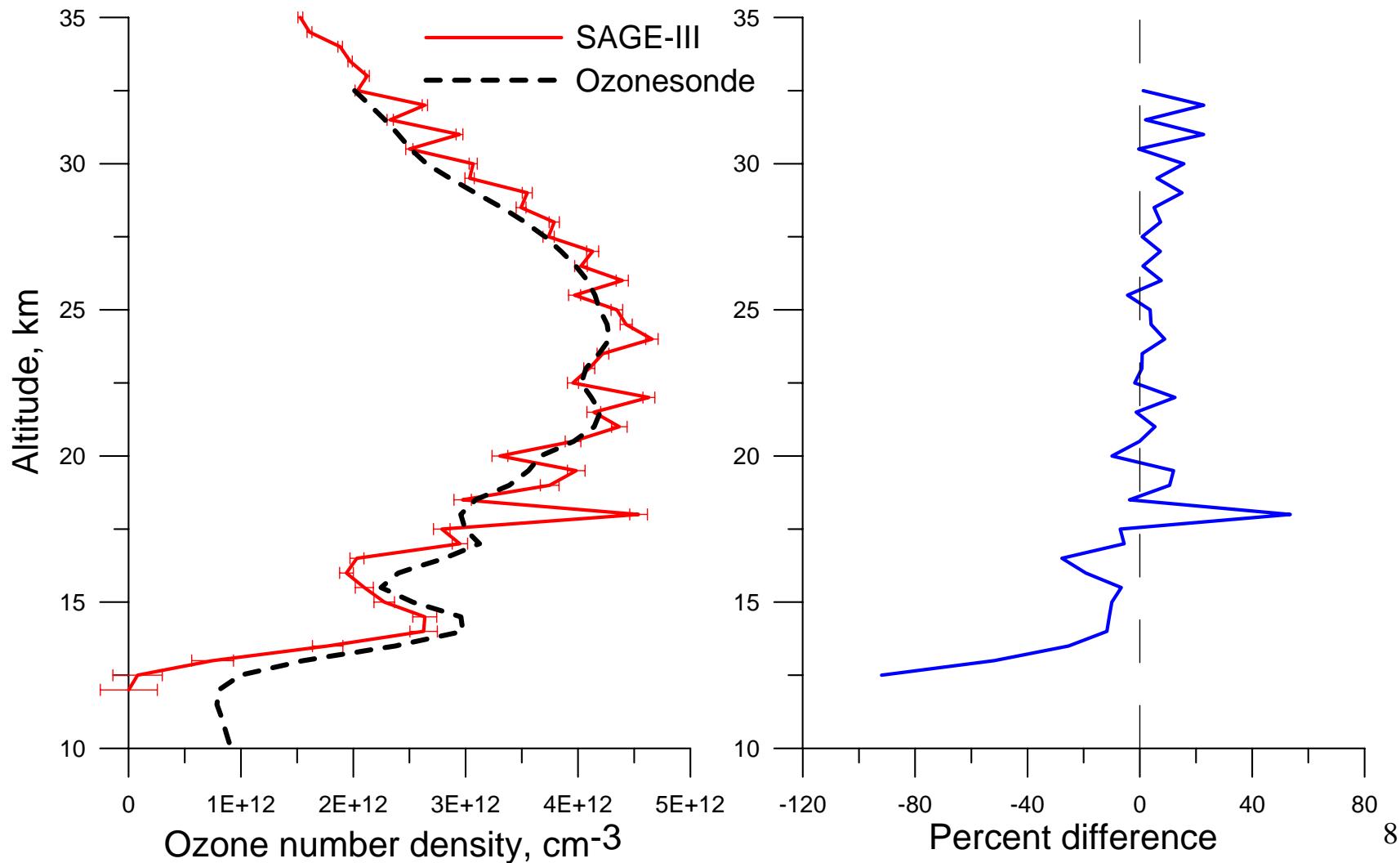
Comparison of Ozone Profiles Retrieved by NASA and SPbSU (Upper Atmosphere)



Comparison of SAGE-III and Sonde Ozone Profiles

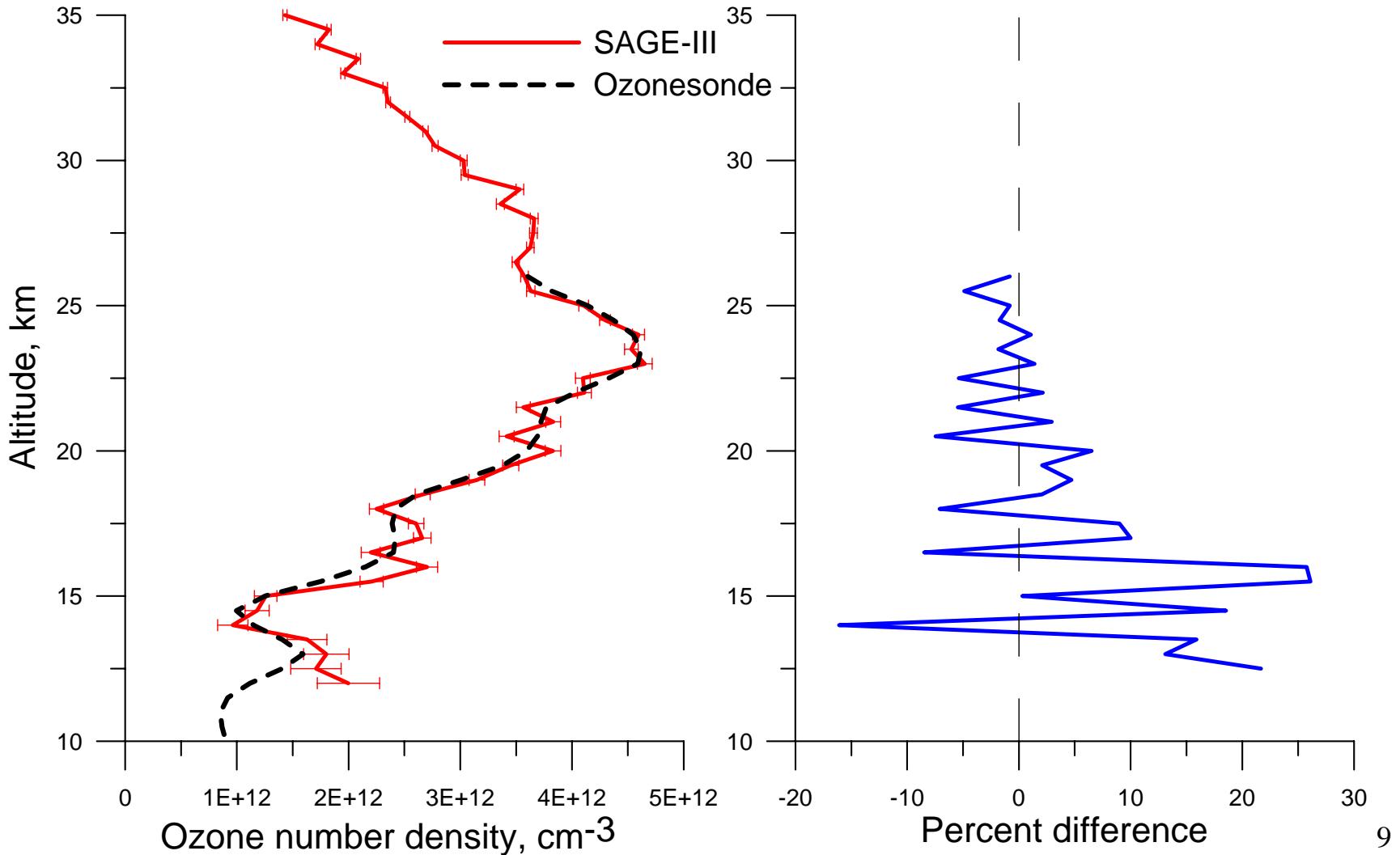
SAGE-III, orbit 235420, 05/31/02, 19:17, 45.72N, 4.75E

Vs ozonesonde (Payerne). Distance 166km, 8h

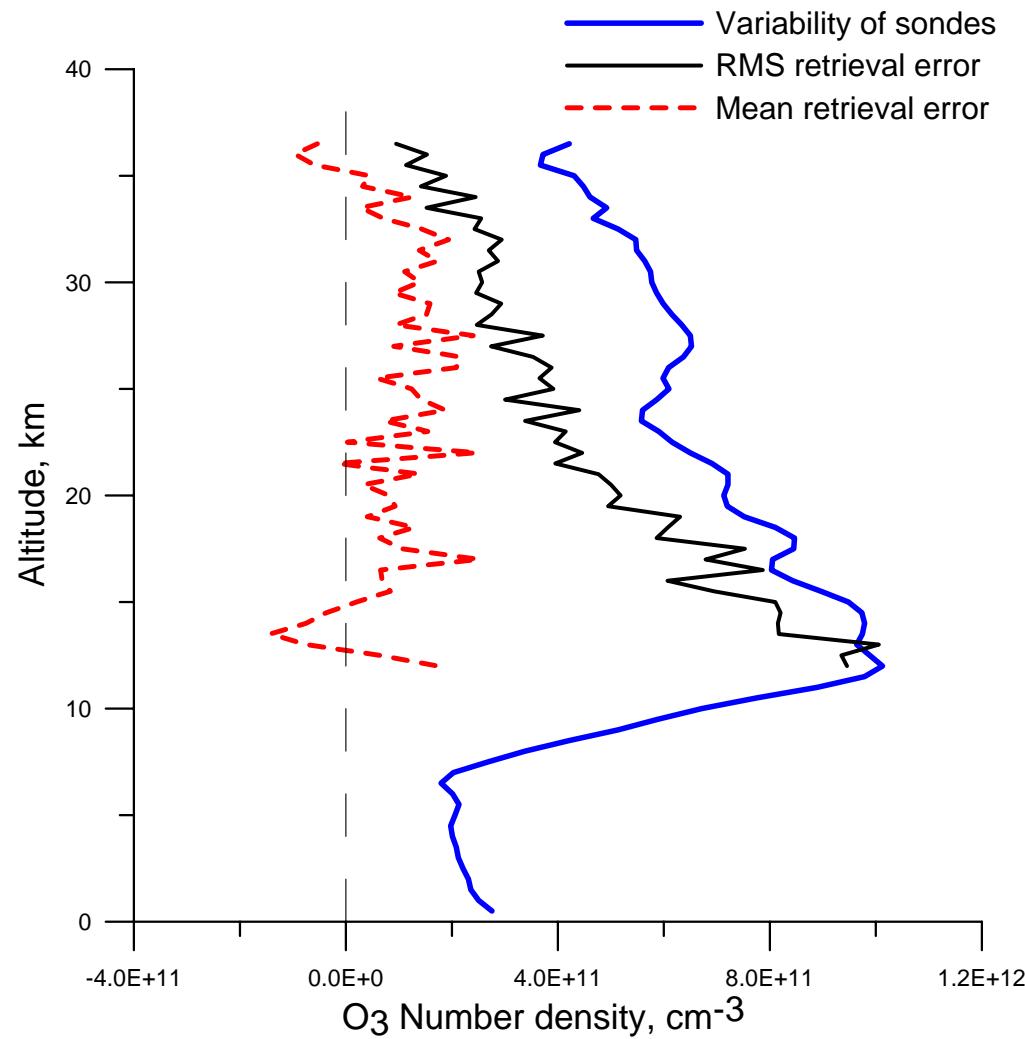


Comparison of SAGE-III and Sonde Ozone Profiles

SAGE-III, orbit 318820, 07/31/02, 19:00, 47.51N, 7.61E
Vs ozonesonde (Payerne). Distance 136km, 8h

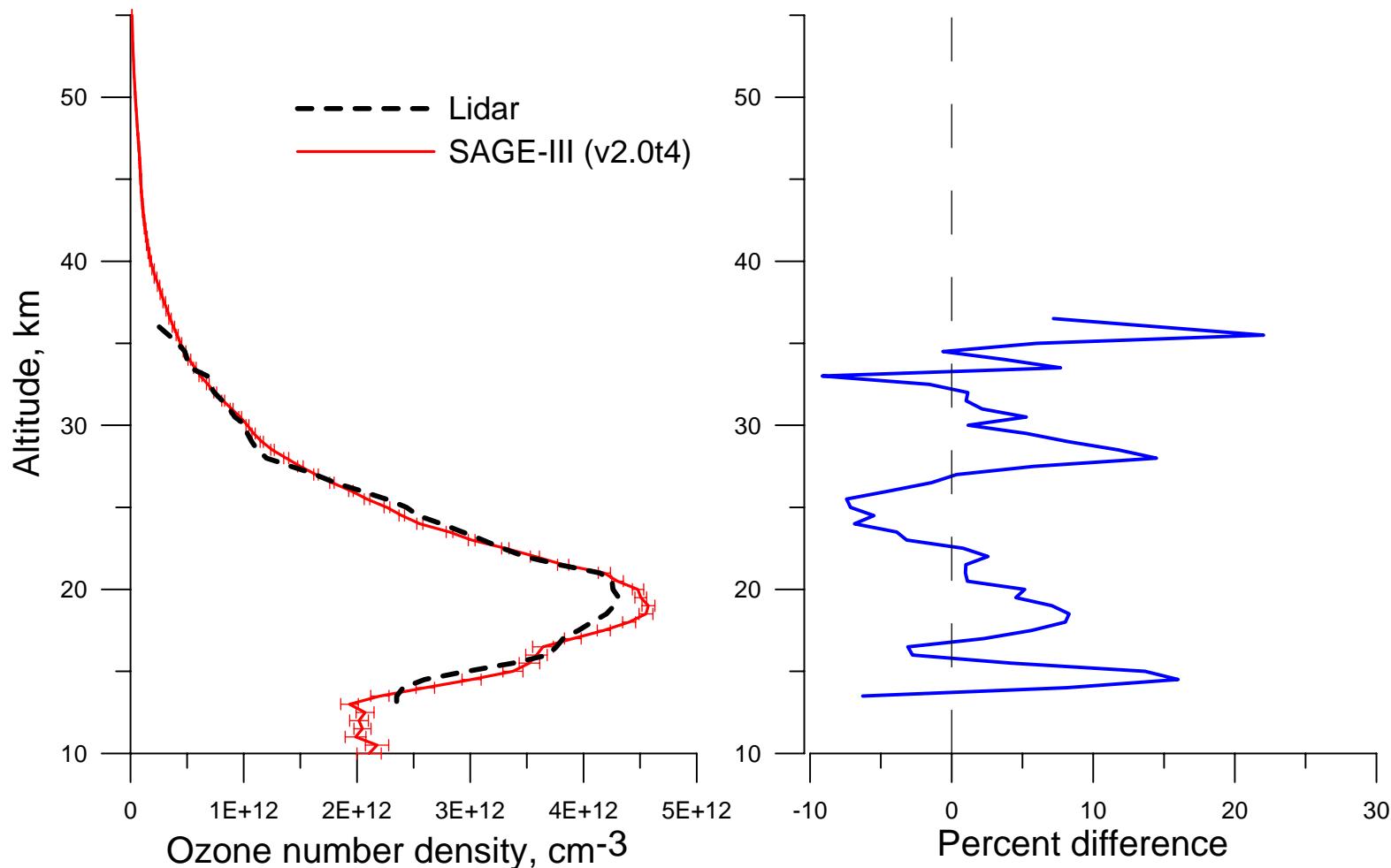


Variability of Ozonosonde and SAGE-III (1b v2.0) Retrieval (v0&vt4) Errors



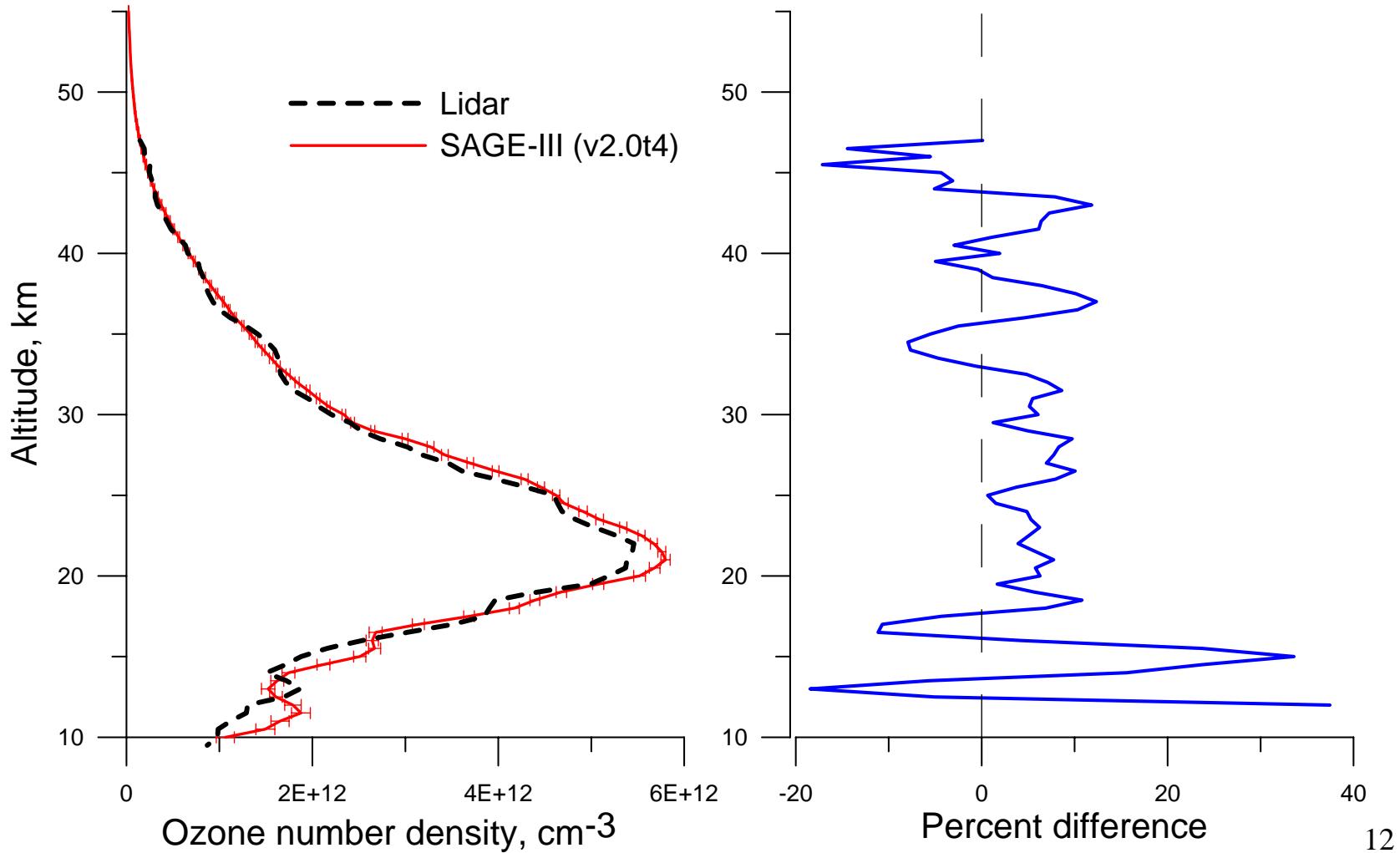
Comparison of SAGE-III and Lidar Ozone Profiles

SAGE-III, v2.0t4, ID 422420, 10/15/02, 13:03, 79.33N, 14.31E
Vs Lidar (Ny-Alesund). Distance 70km, 5h



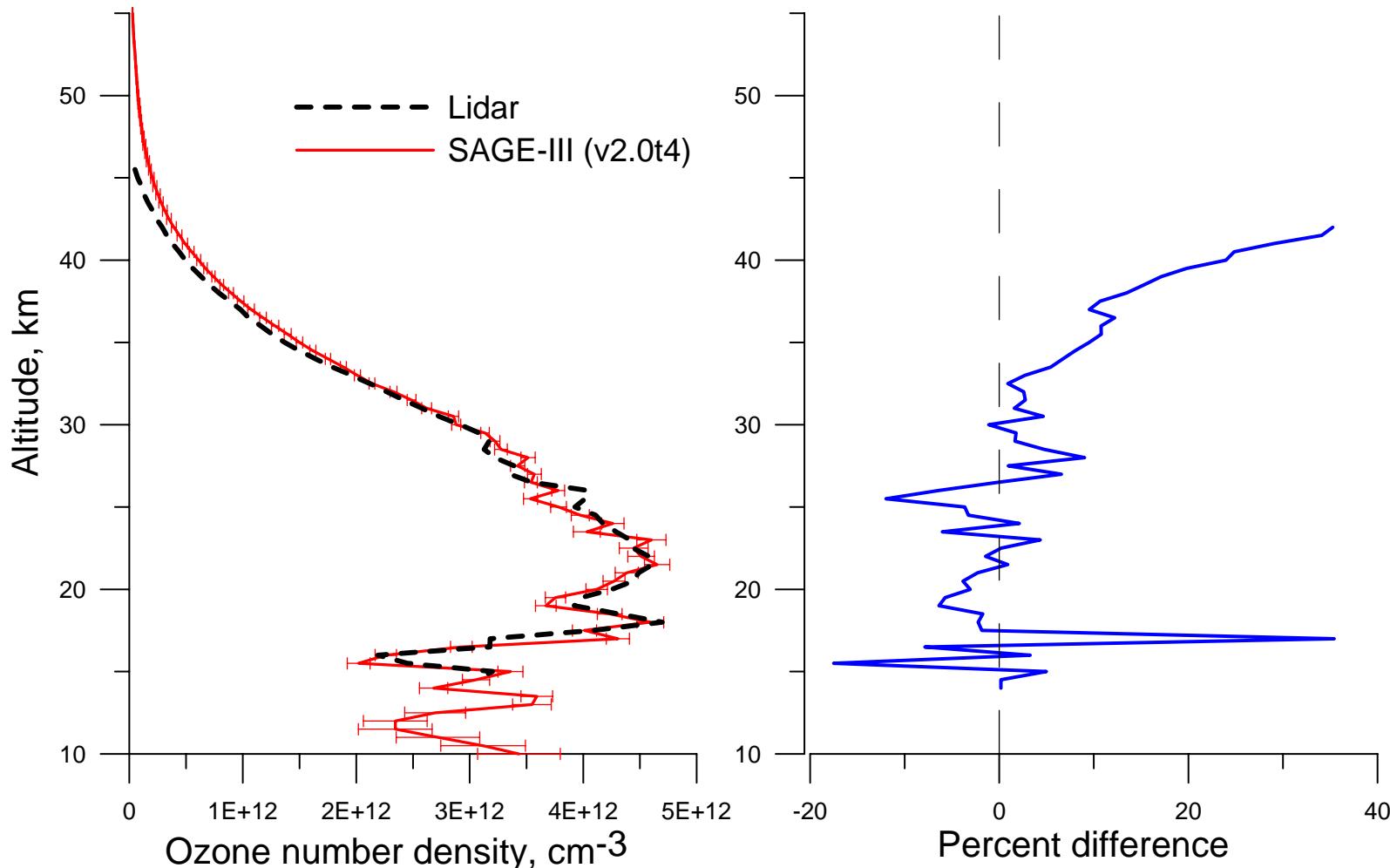
Comparison of SAGE-III and Lidar Ozone Profiles

SAGE-III, v2.0t4, ID 415210, 10/10/02, 07:12, 47.79S, 165.93E
Vs Lidar (Lauder). Distance 429km, 23h

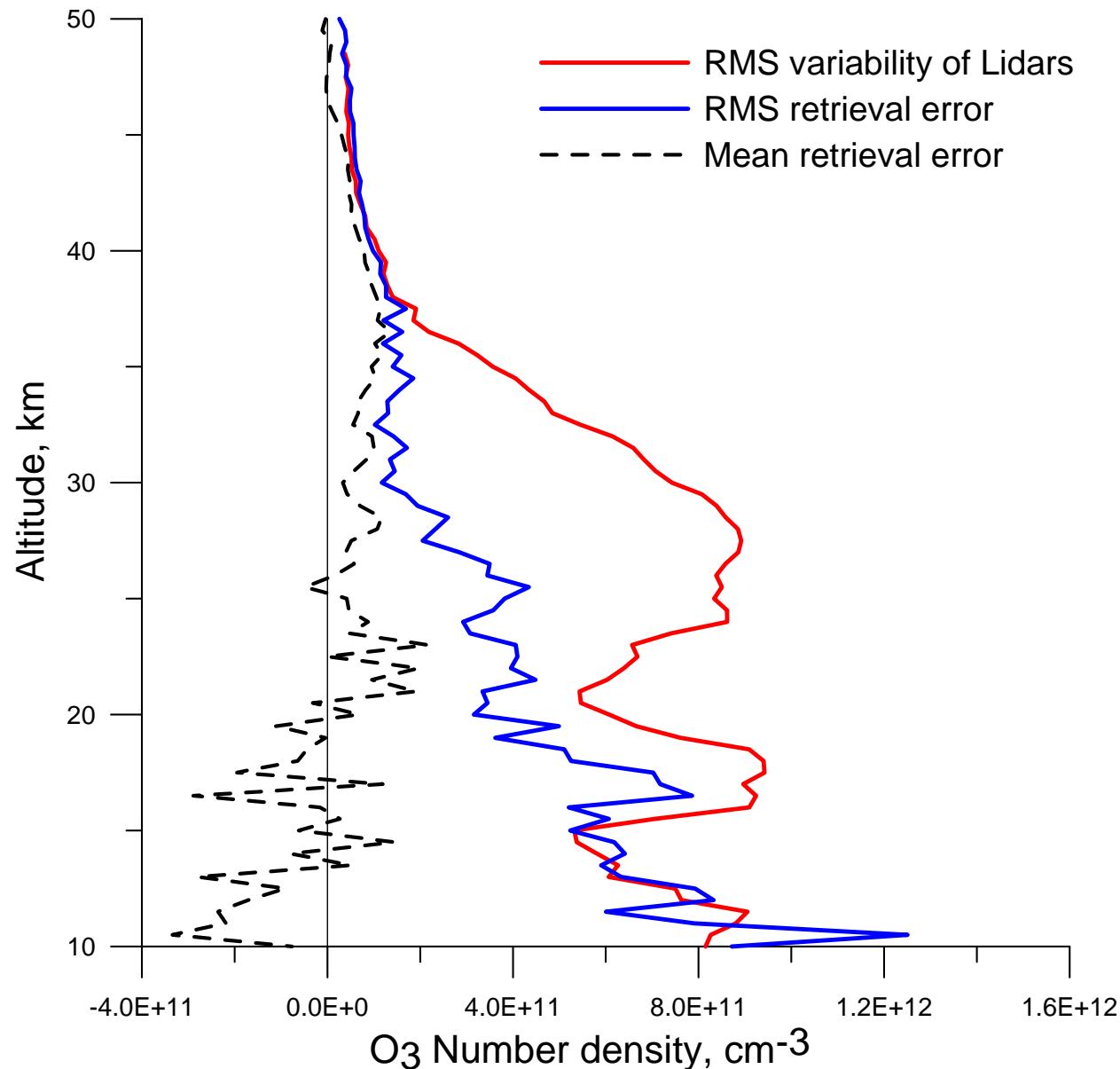


Comparison of SAGE-III and Lidar Ozone Profiles

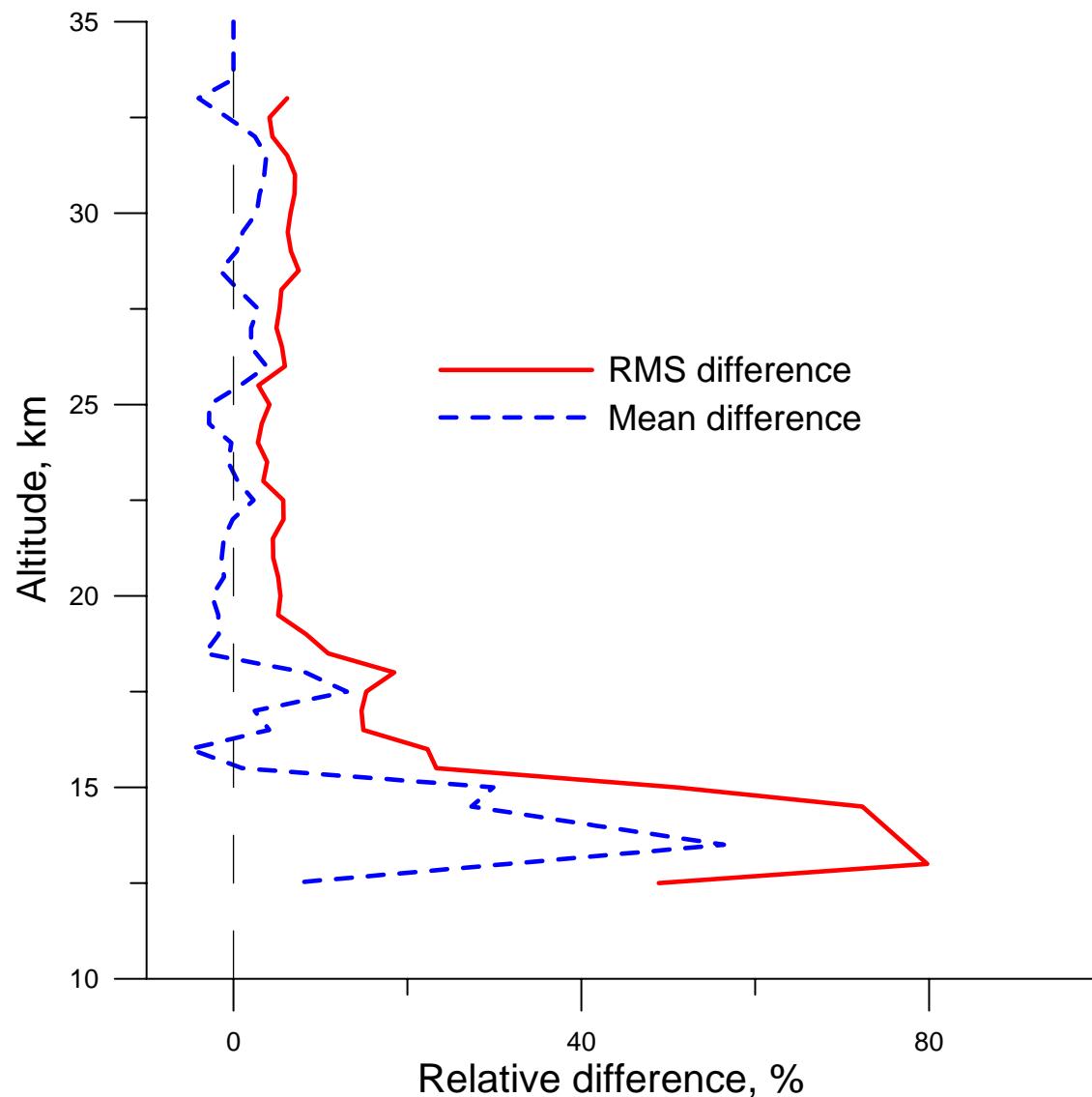
SAGE-III, v2.0t4, ID 221720, 05/21/02, 18:49, 47.69N, 10.83E
Vs Lidar (Hohenpasseberg). Distance 18km, 1h



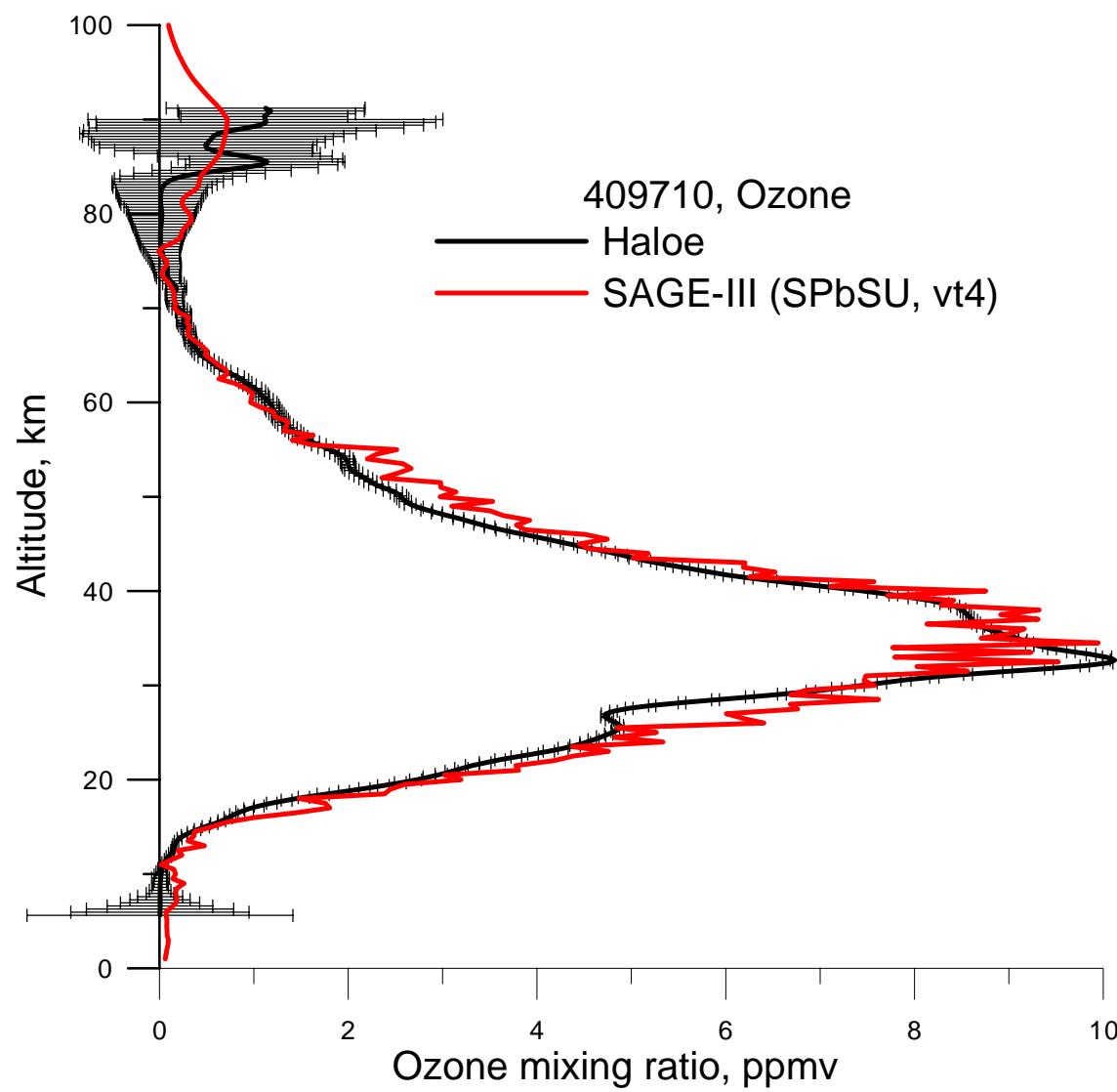
Variability of Lidar Data and SAGE-III (1b v2.0) Retrieval Errors



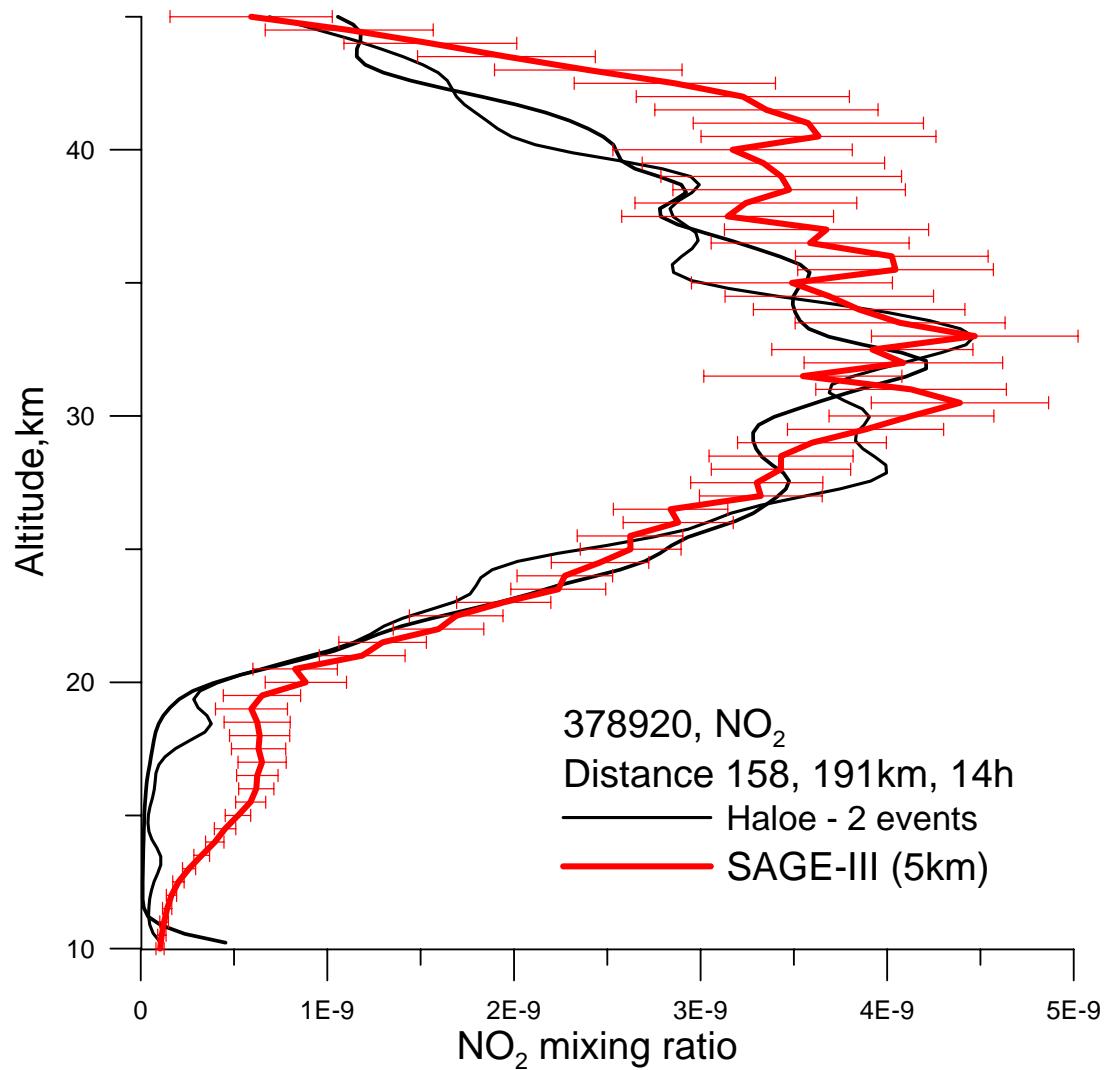
Comparison of Sonde and Lidar Ozone Measurements



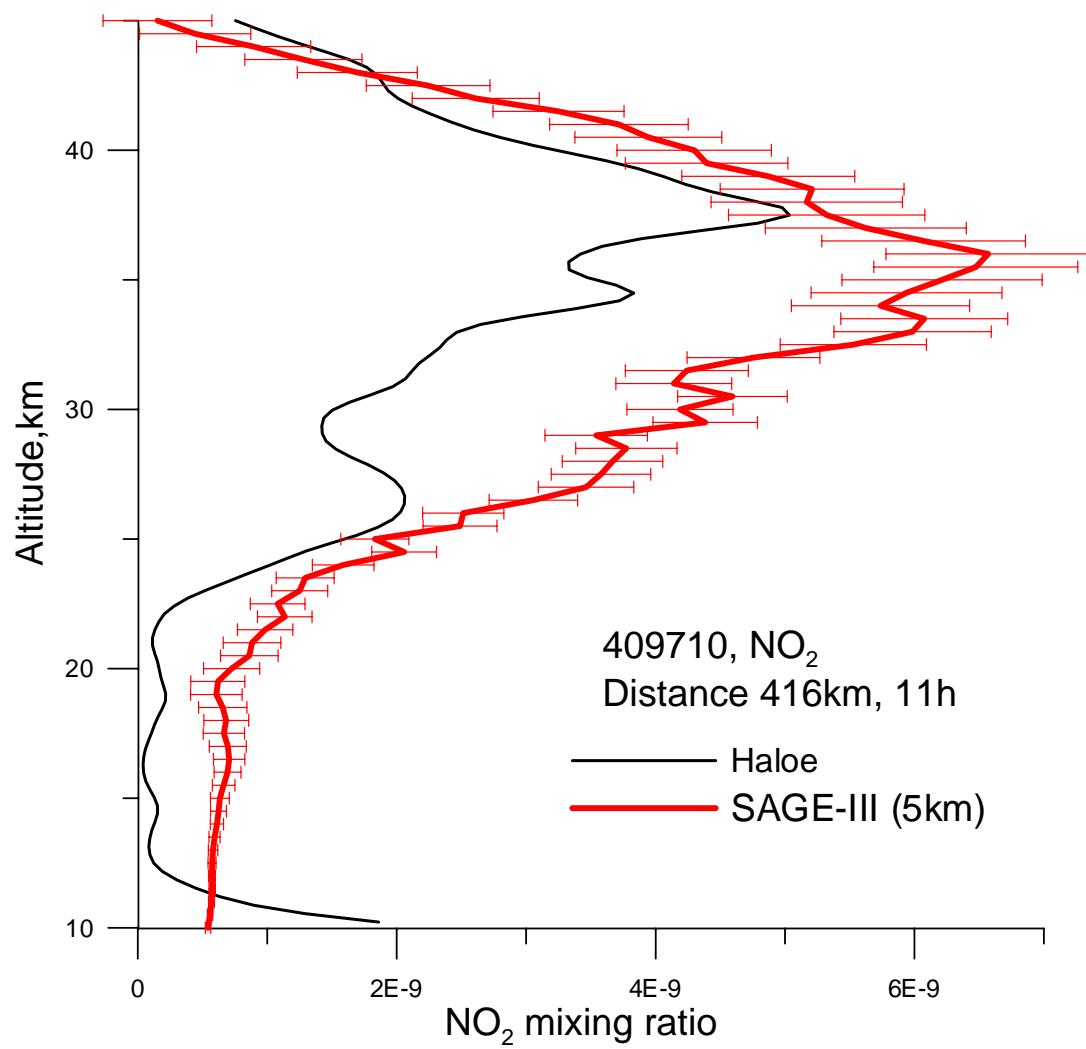
Comparison of the SAGE-III and HALOE Ozone Profiles



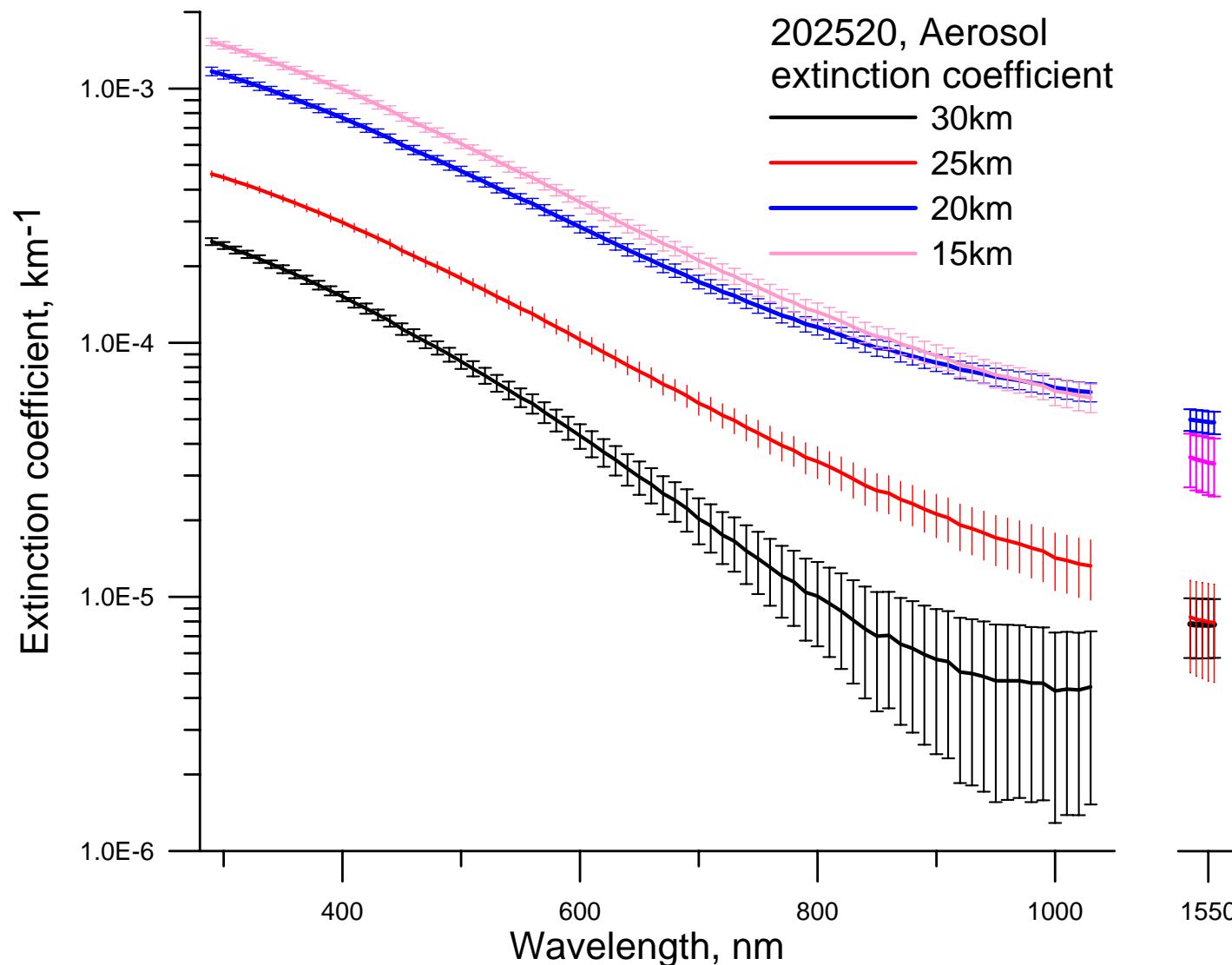
Comparison of SAGE-III and HALOE NO₂ Mixing Ratio Profiles



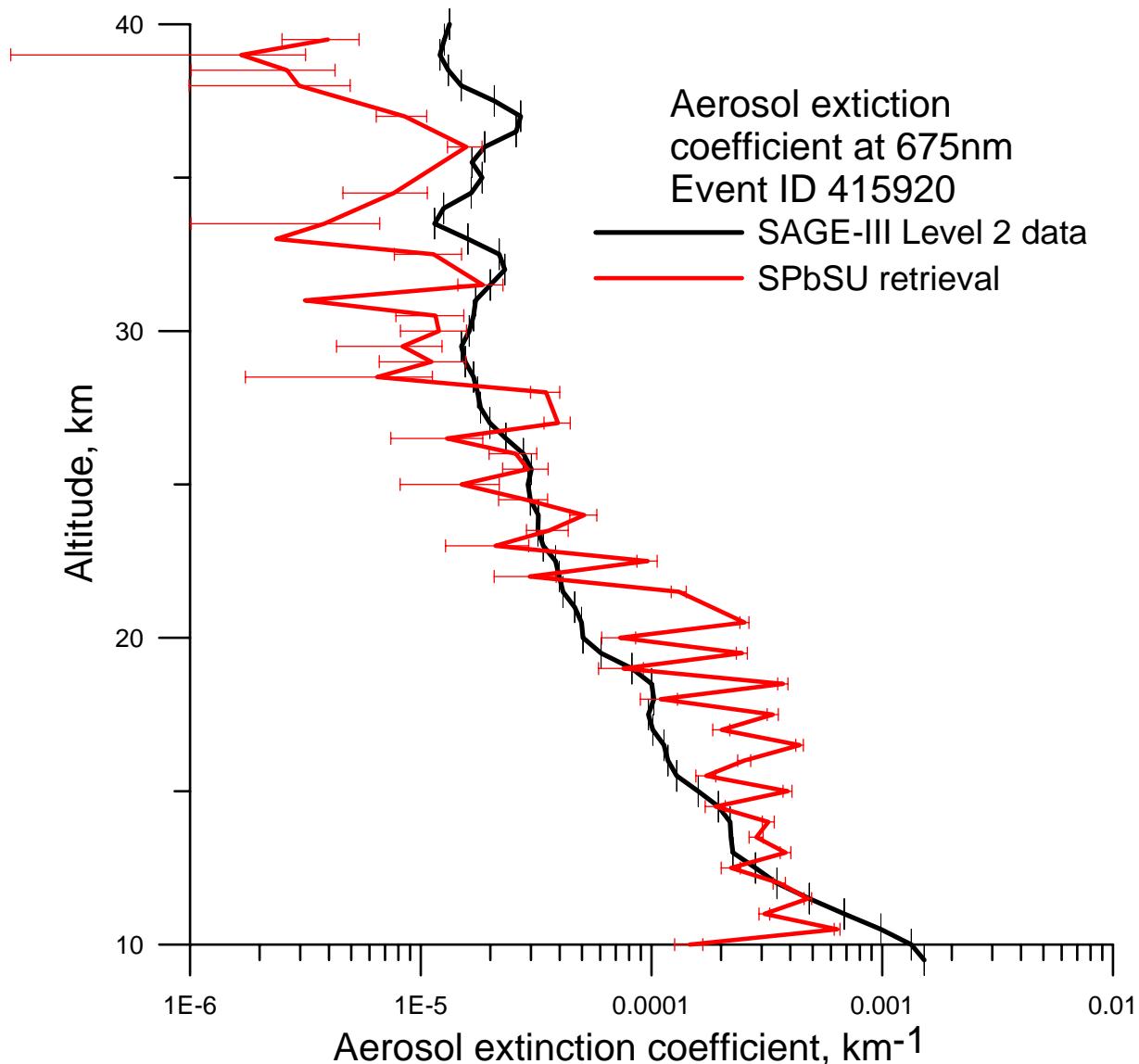
Comparison of SAGE-III and HALOE NO₂ Mixing Ratio Profiles



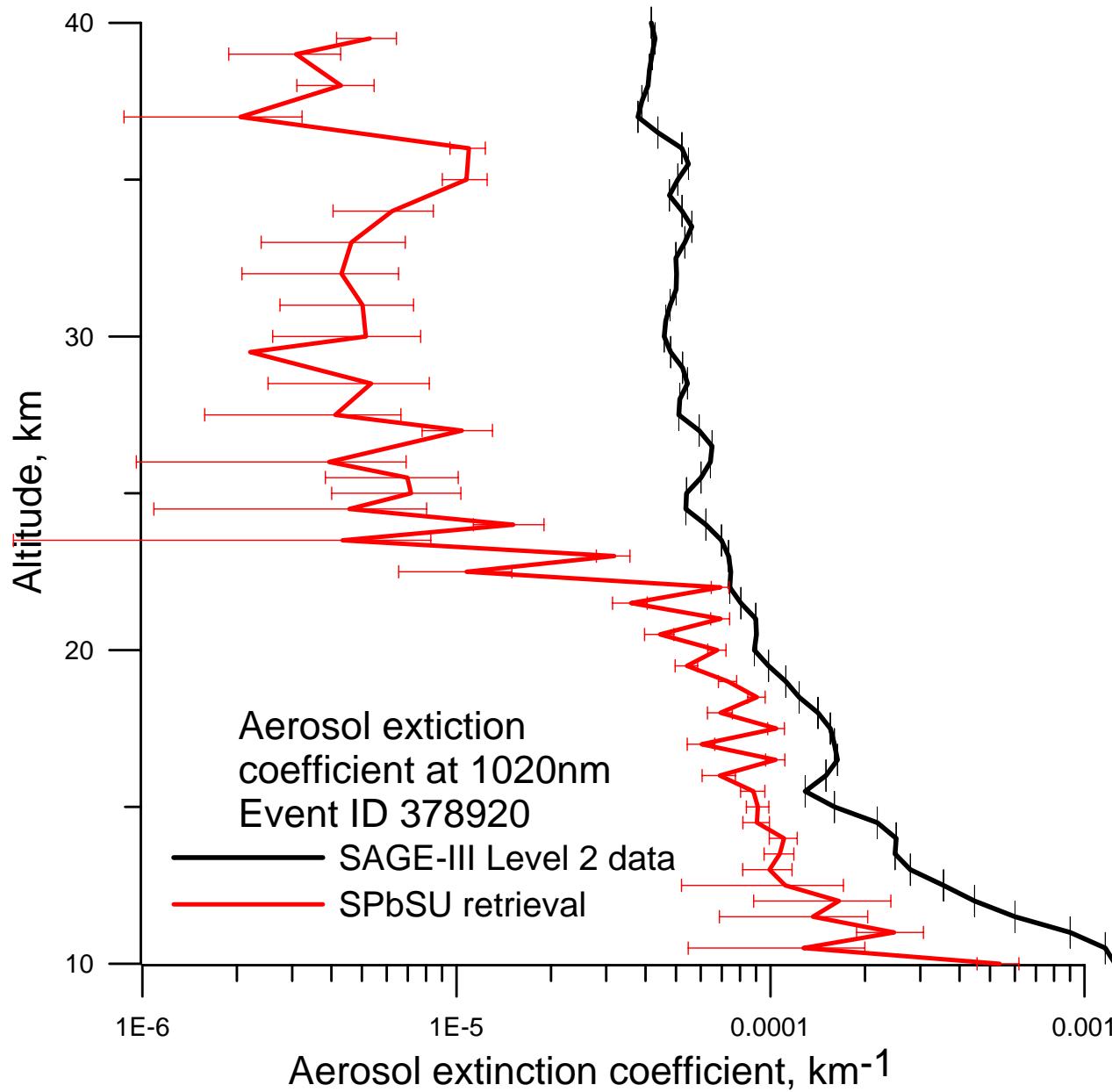
Spectral Dependence of Aerosol Extinction Coefficients at Different Altitudes



Comparison of Retrieved Aerosol Extinction Coefficients (675nm)

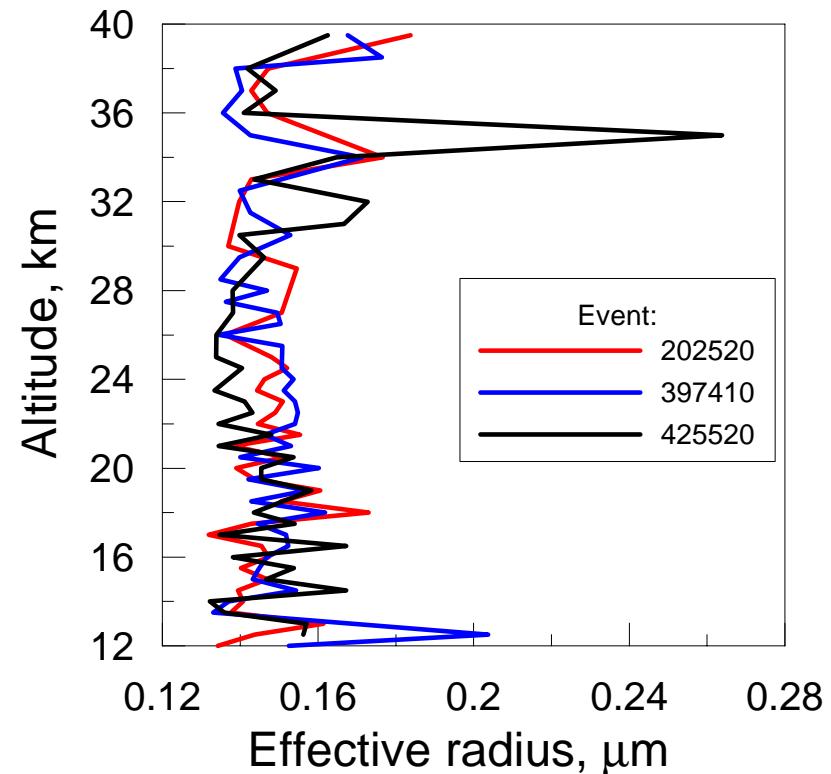
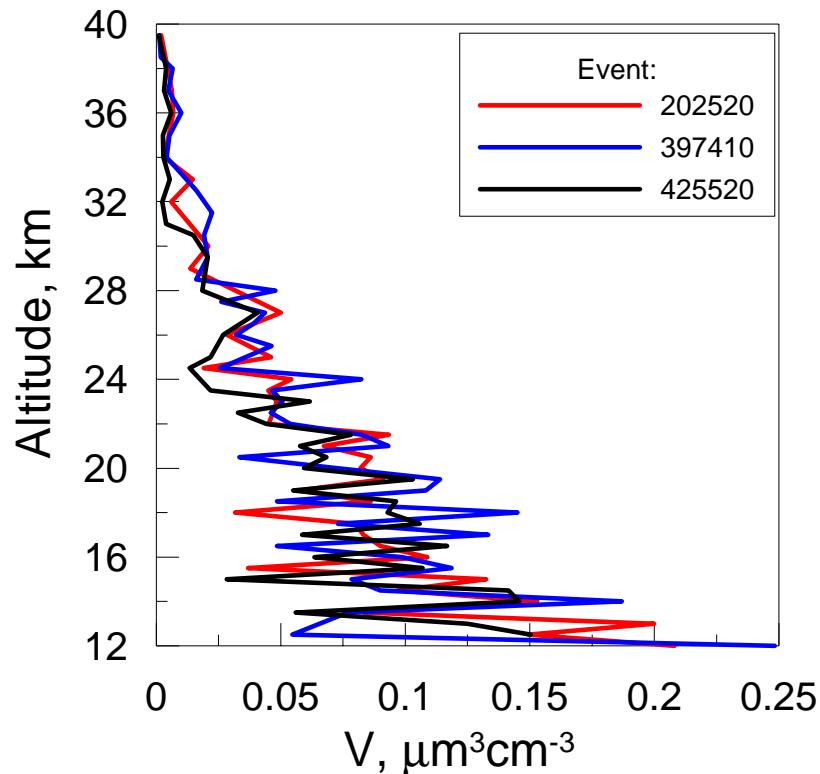


Comparison of Retrieved Aerosol Extinction Coefficients (1020nm)



Interpretation of SAGE III Data

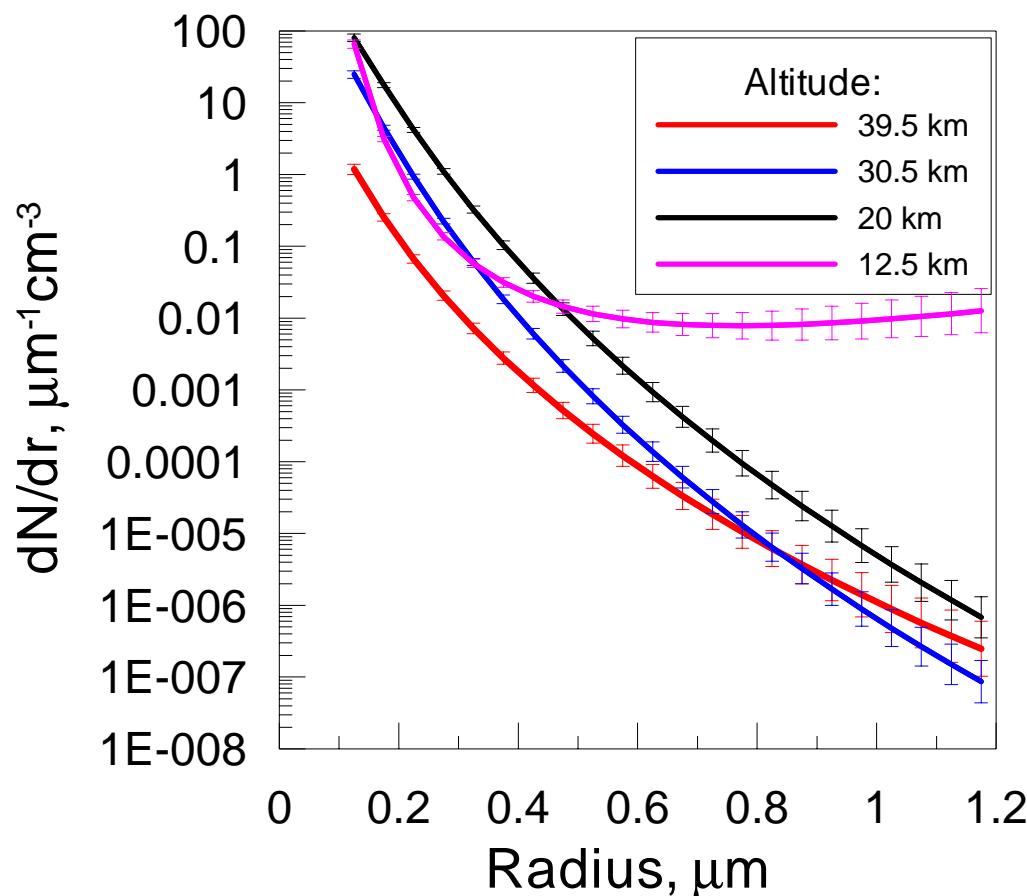
Aerosol volume concentration V and effective radius



Interpretation of SAGE III Data

Aerosol size distribution function

event 397410



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